

US GO Program:  
Status and Cycle 5 Plan

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# Items covered in this talk

- Summary statistics from past cycles
  - Targets by category
  - Some more publication numbers
  - Use of unusual modes
- Plans for Cycle 5
  - Regular & Long Program proposals
  - Key Project selection process
- Highlights from Key Project, Long Program, and other large proposals

# GO Program Overview

- 100% open to competition (except calibration observations and real-time TOO's); no more guaranteed time
- Stage 1 (science) proposals: parallel submission and review in the US, Japan and ESA
  - Now includes Key Project proposals
- International merging meeting to resolve target conflicts; some proposals are “merged” with US and Japanese PIs
- Priority A and B targets are guaranteed to be observed; C targets as schedule filler
- Stage 2 (budget) proposals for US-based investigators
- Additionally, TOO requests can be submitted for unexpected phenomena

## Summary Statistics (almost there)

	AO-1b	AO-2	AO-3	AO-4	AO-5
<b>Period</b>	2006 Apr- 2007 Mar	2007 Apr- 2008 Mar	2008 Apr- 2009 Mar	2009 Apr- 2010 Mar	2010 Apr- 2011 Mar
<b>US Time</b>	5.9 Ms	5.9 Ms	6.0 Ms	4.5 Ms	4.5 Ms
<b>Due Date</b>	1/6/06	11/30/06	12/5/07	12/5/08	11/20/09
<b># Submitted</b>	164	156	120	97+2	
<b>O.S.</b>	4.3	4.4	3.5	4.6	
<b>Res. posted</b>	3/15/06	3/6/07	3/7/08	3/5/09	
<b># accepted</b>	73 (21)	71 (26)	60 (20)	49 (14)	
<b># papers</b>	29	12	1	0	

## Proposals by Category (proposed/observed/published)

	AO-1b	AO-2	AO-3	AO-4
SS	4/1/0	1/1/0	1/0	2/1
Stars	12/4/1	13/5/0	12/2	5/4
CVs	6/3/1	7/2/0	6/3	3/0
XRBs	30/10/5	34/14/0	22/9	23/12
SNR etc.	33/16/7	17/6/1	20/9	13/7
Normal	3/2/0	6/2/1	5/2	4/2
AGN	50/17/9	50/17/6	36/13	30/14
Groups	3/0/0	5/2/1	4/1	5/3
Clusters	22/4/3	21/5/2	14/8	13/5

AO-3 and AO-4 numbers includes LPs and KPs. AO-4 numbers are accepted proposals (inc. Cs and TOOs), previous cycles are observed ones.

# Observations & Papers by mode

- Timing mode: in addition to Cal data, it has been used for Cyg X-1, Cyg X-2, GRS 1915, 1E1207.4, G21.5-0.9, and 1E1547 (TOO). None has been published.
- 1/8 Window: in addition to Cal data, it has been used for 4 XRBs, 1 CV, 4 neutron stars, PKS 2155 & Mrk 421. 5 papers have been published
- 2x2 mode data: Cal obs, 15 XRBs, EV Lac, and 1E1547 TOO. 7 papers from these (non-Cal) observations
- 1/4 Window: numerous, mostly X-ray binaries
- Burst option: numerous, mostly X-ray binaries but also Pup A, W49B, A2495, SGR 1900.

# Notes on Publications

- Japan leads US/Europe in publication
  - The Japanese users of Suzaku are usually team members
  - 3 special issues of PASJ helped keep the publication rate high
- So far in 2009, 33 papers have appeared in ApJ, compared to 12 total in 2008 (most of these are by US groups)
  - 4 each in A&A and MNRAS in 2009, and 42 in PASJ (mostly in the 3rd special issue)
- 26 of 37 AO-1 priority A targets have been published/soon to be published; 25/44 for B targets (2.5-3.5 year old data)
- 29 papers total using AO-2 data so far; 12 from the US, 10 of which have appeared in 2009 (1.5-2.5 year old data)
- 8 papers total using AO-3 data so far (3 using realtime TOO data), only one from a US team (0.5-1.5 years)

# Cycle 5 Schedule

- ROSES-2009 Released Feb 13, 2009
- Call for Proposals released Sep 1, 2009
- Stage 1 Deadline: 4:30 pm EST, Fri, November 20, 2009
- Stage 1 US Review: The week of Jan 25, 2010 (tentative)
  - We always welcome volunteers to serve on the review. However, we cannot take all volunteers due to conflict-of-interest issues
- International Merging Meeting: Late Feb/Early Mar, 2010, in Japan
  - Exact dates TBD. May be scheduled with an ASTRO-H Science Working Group meeting (and will NOT conflict with the HEAD meeting)
  - US is typically represented by the Project Scientist, the Deputy Project Scientist, and 3 of the 4 Panel Chairs
- Observations starts Apr 1, 2010
- Stage 2 process to follow shortly thereafter, with the aim of completing the budget review in July, 2010 (however, as things currently stands, we will have to wait for FY11 money to fund Cycle 5 GOs)

# Cycle 5 Time Allocation

The Time Allocation remains the same since Cycle 4

- Total Available Time: 11,902 ks (360 d x 38 ks/d x 0.87)
- Key Projects: 2,000 ks
  - This is the total available for unimplemented AO-4 Key Project proposal targets, as well as new targets from successful AO-5 Key Project proposals
- US time 3,963 ks + Joint US/Japan time 488 ks
  - ESA 909 ks, Japan (and the rest of the world) 4,542 ks
- By target priority, 11,902 ks is divided into 60% A (including all Key Project targets), 30% B, and 50% C (40% oversubscription)
- Up to 15% can be reserved TOOs and Time-Critical observations
- (New in AO-5) Up to 5% of time can be allocated to observations that use one or 2 units of XIS in the P-sum/timing mode

# Regular & Long Program Proposal Selection

- We plan to keep the same system of 4 panels per review - 2 “Galactic” and 2 “extragalactic” panels
- Regular proposals will be reviewed by one of the 4 panels. International Merging will resolve any target conflicts with Japanese and ESA proposals, by merging or adopting one
- Long Program proposal category is unique to the US review (although all >300 ks proposals will have no proprietary period) - deemed necessary in the US to ensure a good balance of small, medium, and large programs
  - The LP proposals are generally judged on an all-or-nothing basis, and are expected to be equivalent to priority A regular proposals
  - They are evaluated by 2 independent panels, and selected at the final plenary session of the US review based on individual panel comments
  - In AO-4, 1.2 Ms was reserved for LP proposals, 700 ks allocated
  - They are subject to the same merging process as regular proposals

## Key Project Proposal selection - AO-4 process

- Only 2 Key Project proposals were submitted to the US side in Cycle 4. They were both evaluated by 2 independent panels, and carried to the Merging meeting
- An additional, 860 ks LP proposals were re-cast as a Key Project proposal by the final Plenary panel
- These 3 proposals, plus 2 from Japan, were presented to the Merging meeting by the PI or a designated co-I. One US proposal was rejected, the rest were adopted for reduced time during AO-4. Additional adjustments were made to one of the US proposal
- Both PIs of the Japanese KP proposals were on the Merging panel. Two US members of the panel were from the same institution as one of the PIs

# The proposed system for AO-5

- All 4 AO-4 KP proposals are implemented partially during the 1-year AO-4 period. They are automatically eligible for the remainder of the proposed time at the AO-5 merging meeting, and are strongly encouraged to show results of the AO-4 observations
  - Park (Kepler SNR) project has  $860-400+180=640$  ks remaining
  - Reynolds (AGN Fe line) project has  $1,700-450=1250$  ks remaining
- US and Japan will both bring up to 2 Ms of existing or new KP observations to the merging meeting
  - Pre-selection at the national review is now an explicit requirement
- The decisions will be made by a closed meeting of the Merging panel as in AO-4
- KP proposers will participate in an open workshop, to be held in Japan just prior to the Merging panel meeting, to make the case for their proposals and answer questions. This is meant to curb aggressive questioning by the panel (including competing proposers)

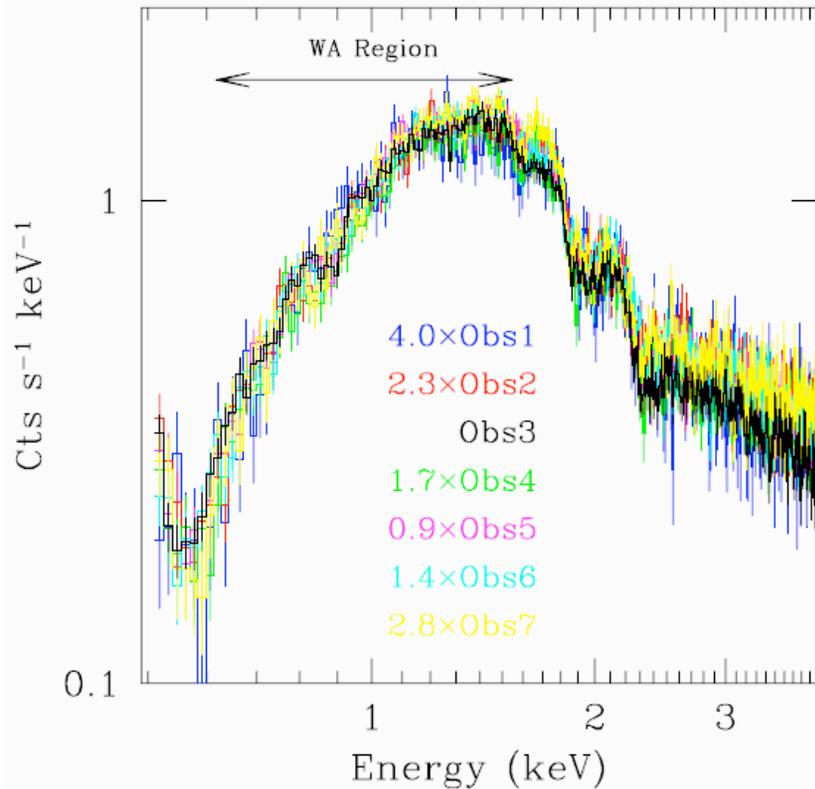
# Issues and Questions with the Process

- **Conflict of Interest issues**
  - The issue within US was created by the promotion of a LP to KP
  - The Japanese community is small enough that a US-style, conflict-free proposal review is difficult.
- **Confidentiality issues**
  - Under the US system, proposals are treated as confidential. Is it legal/wise to have an open workshop? Would the proposers feel free to include all the information at their disposal?
  - US review participants sign a confidentiality agreement
- **International balance of participants in the workshop**
  - Proposal to hold the workshop in Hawaii in connection with the HEAD meeting did not work out
  - Holding the workshop adjacent to an ASTRO-H SWG meeting might help
- **What is the exact relationship between the open workshop and the closed Merging panel meeting?**

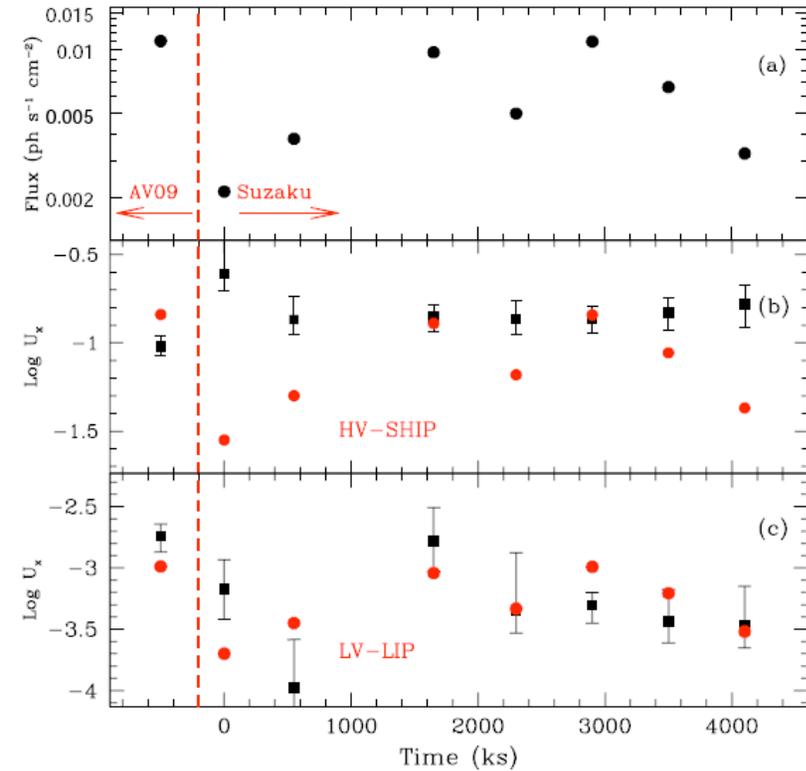
# Major US projects (Regular, LP, KP)

- NGC 5548 (AO-2, regular), 7x30 ks, PI: Elvis
- NGC 3227 (AO-3, LP), 6x50 ks, PI: Elvis
- NGC 4051 (AO-3, LP), 340 ks, PI: Turner
- Tycho SNR (AO-3, LP), 400 ks, PI: Hughes
- Kepler SNR (AO-4, KP), 400 ks+, PI: Park
  - Several BGD observations done, none of the SNR proper yet
- Fe K lines in AGN (NGC 3783 and NGC 3516 in AO-4, KP), 450 ks+, PI: C. Reynolds
- Cyg X-1 (AO-4, LP), 20 x 15 ks, PI: J. Miller
  - One viewing window's worth of observations taken
- NEP/SEP (AO-4, LP), 4 x 2 x 50 ks, PI: Snowden
  - SWCX observation using the focusing cone, TC observations in Nov/Dec
- Abell 426 (AO-4, regular), 260 ks in 2 x 7 pointings, PI: S. Allen
  - Observations taken very recently, no results yet

# NGC 5548/NGC 3227



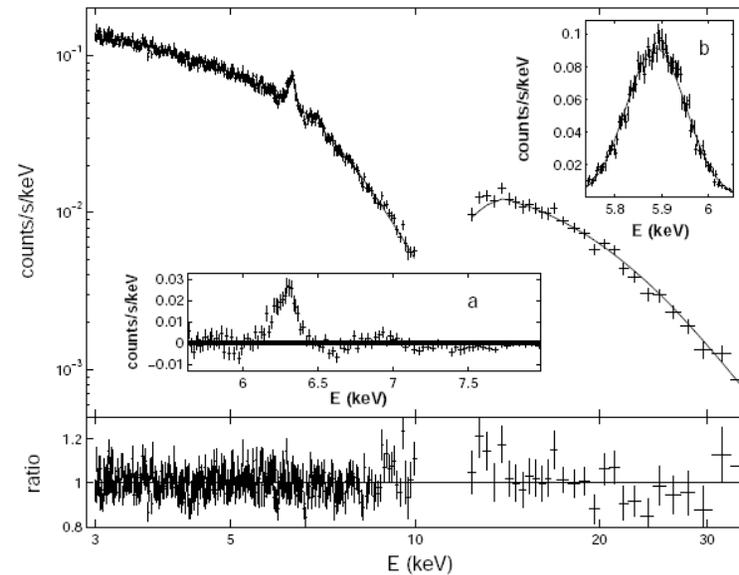
NGC 5548 varied by a factor of  $\sim 4$  but the warm absorber did not obviously vary.



In particular, high ionization component is steady; low ionization absorber may have varied

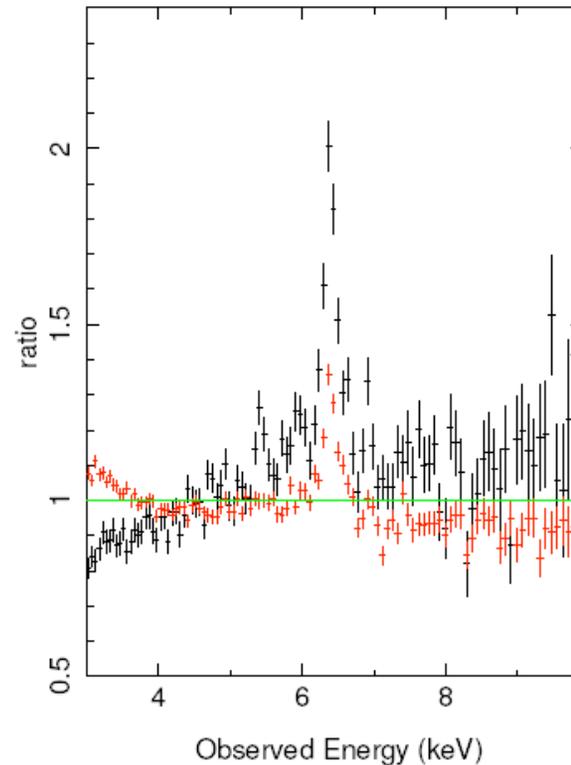
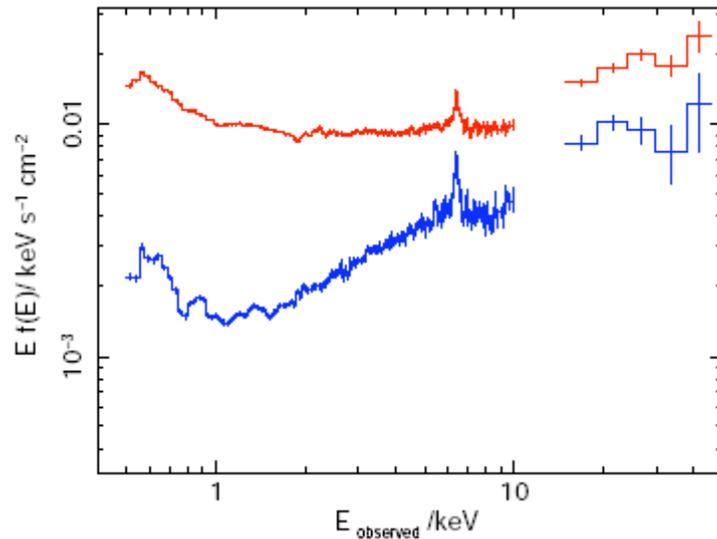
# NGC 5548/NGC 3227 (2)

- Two papers from the NGC 5548 campaign in the refereeing process
- One paper on rapid variability of cold absorber in NGC 3227 in an advanced stage of preparation
- Additional papers are being planned, to be led by the newly hired post-doc



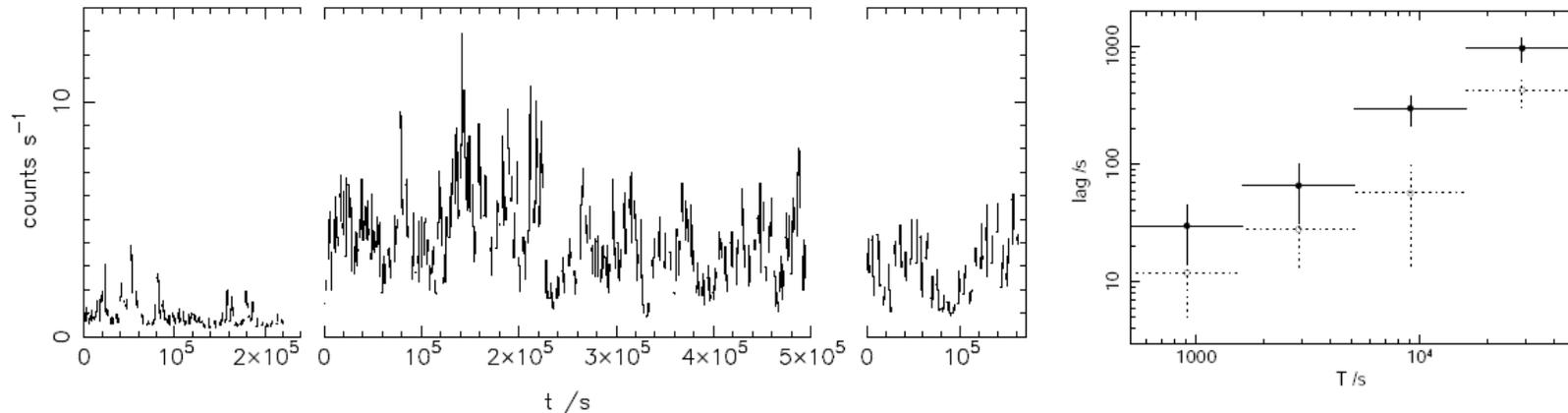
Fe K-alpha and K-beta lines detected. Both the width (4200 km/s FWHM) and lack of variability consistent with a distant (20-40 light days) origin

# NGC 4051 (1)



NGC 4051 was observed in 2005 (low) and 2008 (high). The 2005 data show clear lines at 5.44 and 5.99 keV. The 2008 data are consistent with these lines being present at the same flux level

# NGC 4051 (2)

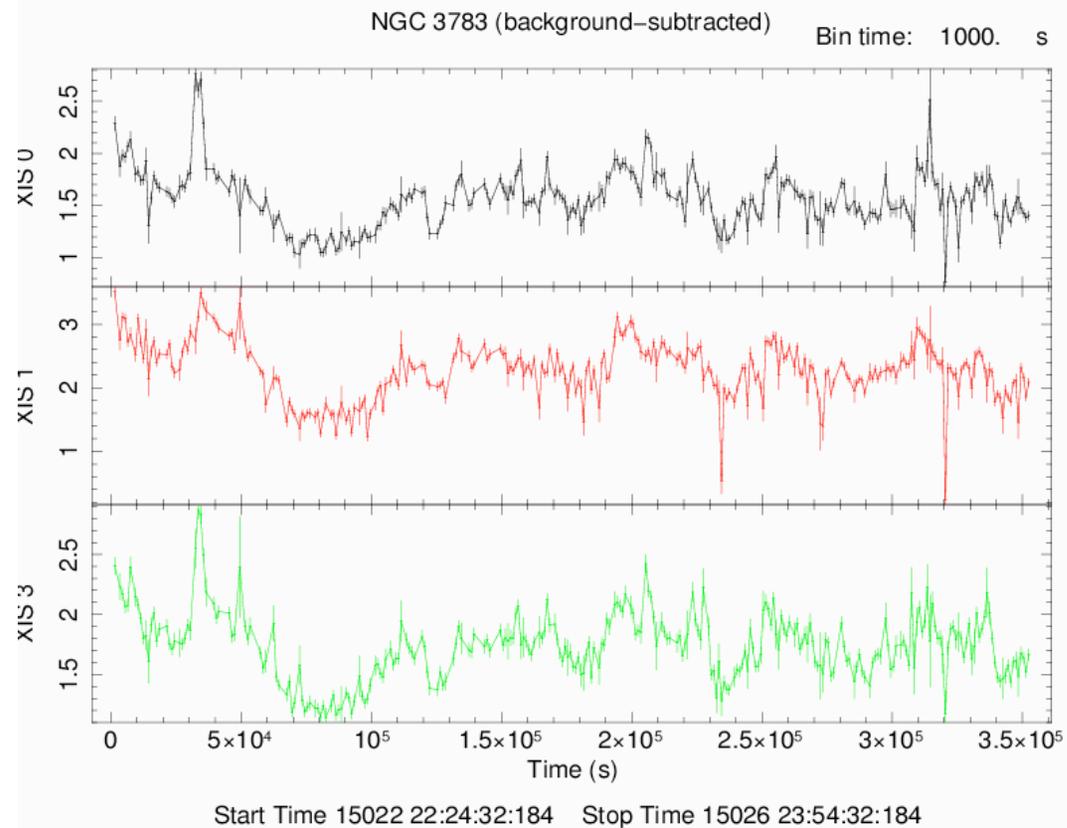


The strong variability of NGC 4051 (left) can be analyzed using a variety of techniques. Energy-dependent time-lag (right) is one example.

Turner and collaborators have just submitted 3 papers based on the 2005 and 2007 Suzaku data on NGC 4051

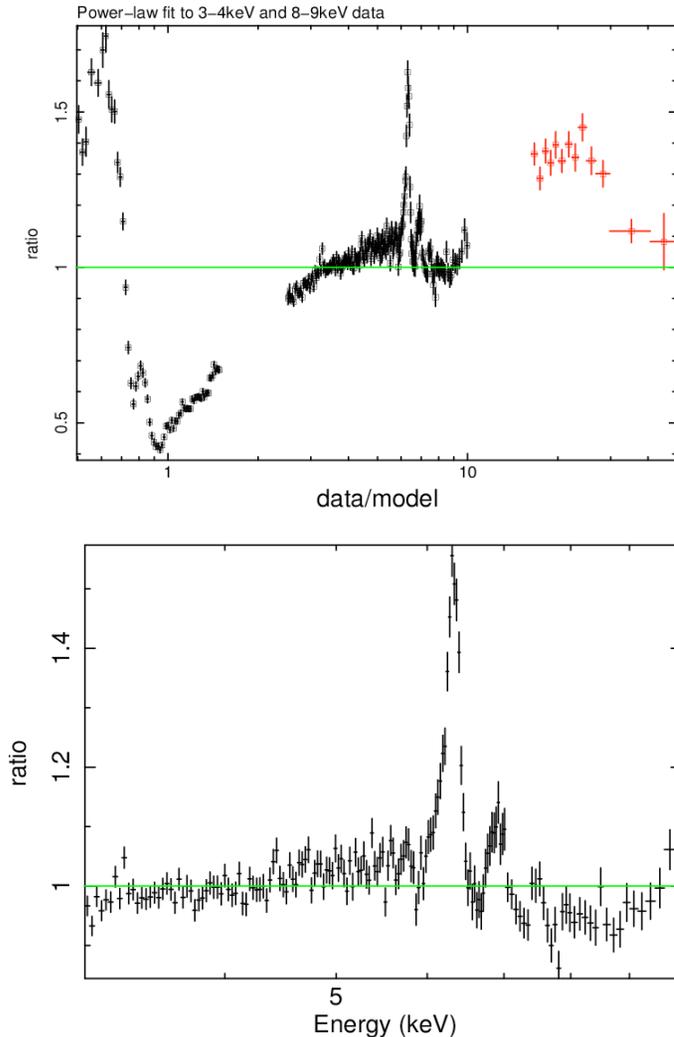
# NGC 3783 (1)

This Key Project aims to search for relativistic effects in a set of nearby, bright AGN. Of the two approved in AO-4, NGC 3783 was observed in July, NGC 3516 is yet to be scheduled.



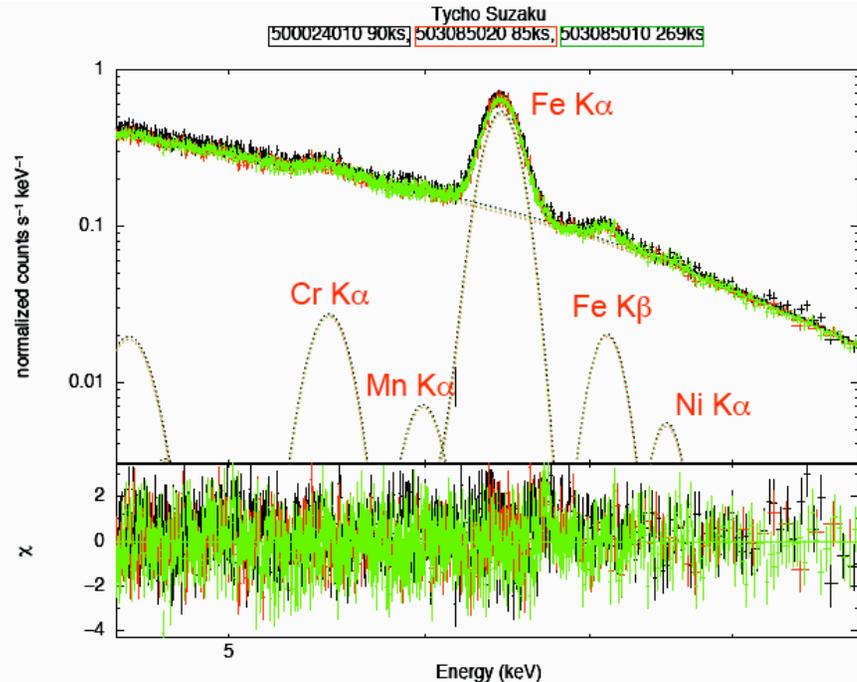
Significant variability seen during the 360 ks (elapsed; 210 ks good time) observation

# NGC 3783 (2)



- All the expected components seen - power law, reflection, strong warm absorber edge, and the Fe K alpha complex.
- There are narrow 6.4 and 6.97 keV lines, plus a broad component extending down to 4.5 keV.
- Analysis underway to model the warm absorber using non-simultaneous HETG data so the broad line can be securely characterized. (Due to spacecraft constraints, simultaneous HETG observation was not possible.)

# Tycho SNR



Jack Hughes, the PI of the Tycho LP proposal, is a co-I on the Kepler KP proposal: do they have different types of progenitor?

- Long (400 ks) observation of Tycho was obtained to (1) determine the average line flux ratio more accurately; and (2) to perform a spatially resolved analysis.
- Revised Mn/Cr flux ratio=0.27+/-0.09, implying a 0.8-2.5 solar progenitor. Will be compared with the Kepler SNR results.
- Ni K $\alpha$  also detected.
- Spatially resolved analysis in progress.